

LEPANUS STOREYI, A NEW SPECIES OF DUNG BEETLE (COLEOPTERA: SCARABAEIDAE: SCARABAEINAE) FROM SOUTHEAST QUEENSLAND

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Abstract

Lepanus storeyi sp. n. is described from high altitudes in Lamington and Springbrook National Parks in southeast Queensland and compared with other species in the genus. Notes are given on its habitat and conservation status.

Introduction

Matthews (1974) placed *Lepanus* Balthasar in the subtribe Canthonina of the tribe Scarabaeini, but more recent classifications (Cambefort 1991a, 1991b, Phillips *et al* 2004) elevate the Canthonina to the status of one of twelve recognised tribes in the subfamily Scarabaeinae. Currently there are 23 described Australian species of *Lepanus*, but there are at least as many undescribed species (T.A. Weir and G.B. Monteith, unpublished data), distributed mainly along the east coast of Australia from Victoria to Cape York, with several outliers in southwest Western Australia and across northern Australia (Matthews 1974). Two species were recently described from South Australia (Matthews and Weir 2002).

The new species described here was taken in temperate *Nothofagus* rainforest above 1000 m in Lamington and Springbrook National Parks in southeast Queensland. It is unusual within the genus in exhibiting sexual dimorphism with regard to the pygidium and in being brightly coloured.

Specimens are deposited in the Queensland Museum, Brisbane (QM) and the Australian National Insect Collection, Canberra (ANIC).

Genus *Lepanus* Balthasar, 1966

Matthews (1974) provided a detailed redescription of this genus and discussed its relationship with the genus *Panelus* Lewis. The new species described below exhibits the generic characters described therein for *Lepanus*.

***Lepanus storeyi* sp. n.**

(Figs 1-7)

Types. *Holotype* ♂, QUEENSLAND: QLD 28.260°S x 153.167°E, Lamington NP, Plot # IQ-1100-C, 1106 m, 16-26.i.2007, rainforest, flight intercept trap, G.B. Monteith, 22177, T145443 (QM). *Paratypes*: 1 ♂, same data as holotype but T145444 (QM); 1 ♂, same locality, 22-27.x.2006, rainforest, R. Menendez, G. Monteith, fungus pitfall, 30717, T145441 (QM); 1 ♂, QLD 28.259°S x 153.162°E, Lamington NP, IBISCA Qld Plot # IQ-1100-B, 1142 m, 17-27.x.2006, rainforest, G. Monteith, flight intercept trap, 20771, T145442 (ANIC); 1 ♀, same locality, 27.i.2008,

rainforest, A. Nakamura, 32045, bark spray S side, T155875 (QM); 1 ♂, 1 ♀, SEQ 28°14'S x 153°16'E, Springbrook Repeater, 31.x.-31.xii.1997, G. Monteith, 1000 m, rainforest pitfall, 5649, T83548 and T83549 (ANIC); 2 ♀♀, same locality, 9.i.-19.ii.1995, G.B. Monteith, intercept traps, 1000 m, T65324 and T83546 (QM).

Description. Black; pronotum reddish; humeri and apical edges of elytra yellow; pygidium yellow in male and orange in female; antennal club pure white; fore tibiae orange; all tarsi orange. Total length 2.4-2.7 mm; greatest width (across middle of elytra) 1.6-1.8 mm.



Fig. 1. *Leptanus storeyi* male, habitus.

Male. Head. Clypeal teeth short. Dorsal surface smooth, nitid, glabrous, densely punctuate with small shallow round punctures separated by at least their own diameter, becoming very fine on clypeus. Dorsal part of eyes narrow; maximum width contained about 17 times in interocular space.

Prothorax. Anterior angles subquadrate. Sides of pronotum straight and subparallel to subquadrate posterior angles. Hind margin evenly curved with a slight obtuse projection in the middle. Pronotal surface smooth, nitid, punctuate with shallow round punctures each bearing an extremely fine, fully recumbent seta; punctures on disc smaller and shallower than those on head and separated by twice their own diameter, while those towards the anterior angles are the same size and depth as the ones on head and separated by their own diameter. A row of larger, slightly umbilical, elongate punctures each with a fully recumbent seta present along middle two thirds of hind margin.

Elytra. Striae barely visible, obsolescent. Elytral surface smooth, nitid, with sparse minute punctures each with an extremely fine, fully recumbent seta.

Hind wings. Fully developed.

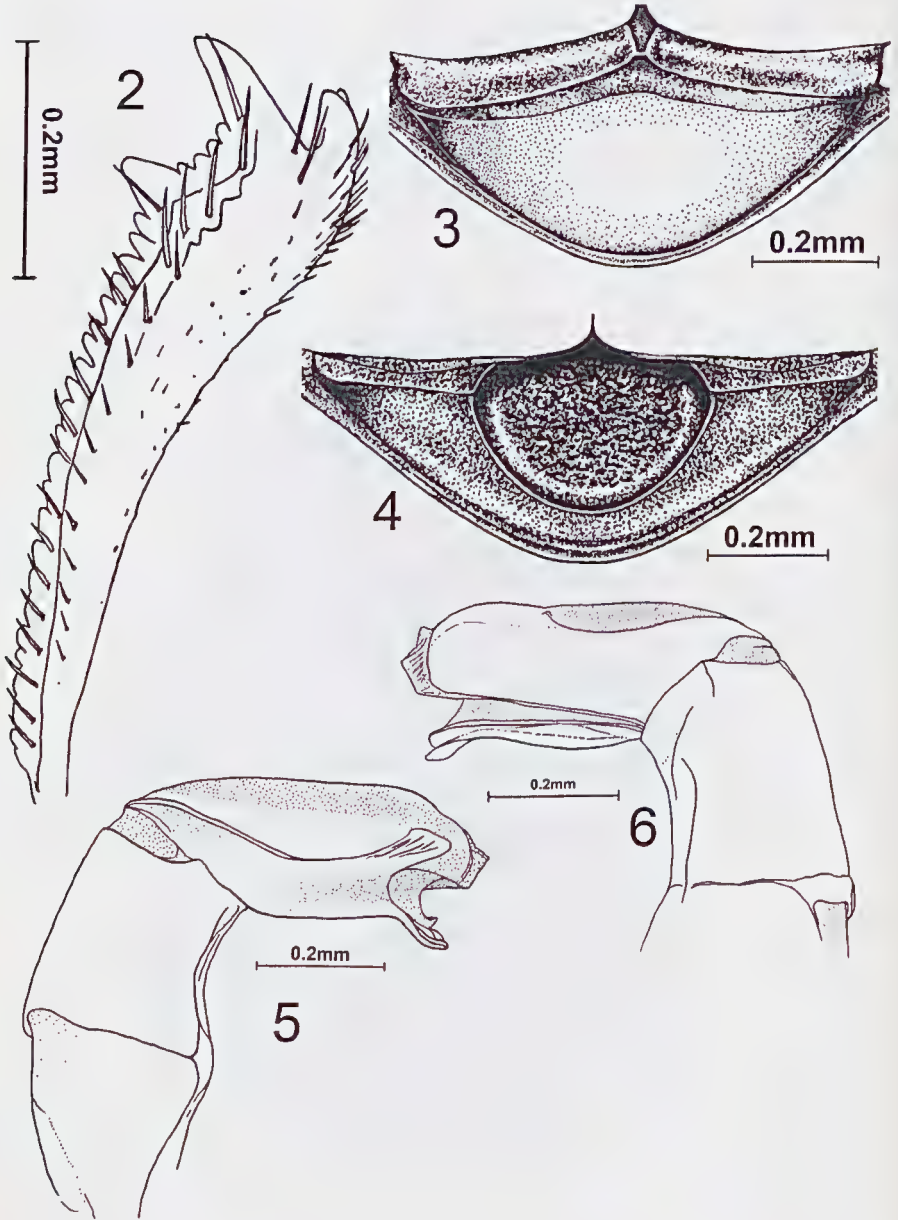
Thoracic ventrites. Mesoventrite and medium lobe of metaventrite smooth, nitid, with sparse minute punctures, as on elytra, glabrous; lateral lobes of metaventrite shagreened anteriorly, with small shallow punctures each bearing an extremely fine long seta. Metepisterna shagreened. Meso-metaventral suture nearly straight with a minute, posteriorly directed acute angle in the centre.

Legs. Fore tibiae (Fig. 2) with two acute teeth on outer distal edge, which is serrate between teeth and proximal to them. Apical digit parallel sided, truncate, slightly notched at apex and shorter than apical tooth. Fore spur absent. Middle and hind legs unmodified. Claws a little expanded basally but not angulate or dentate.

Abdomen. Pygidium (Fig. 3) convex, smooth, nitid, with sparse minute punctures, as on elytra, each bearing an extremely fine seta. A fine transverse fold runs close to and parallel with anterior edge and extends to lateral angles. Aedeagus as in Figs 5-6.

Female. Fore tibiae with apical digit short, bearing a tapering spur that is shorter than apical tooth. Pygidium (Fig. 4) with a large, oval, deep depression with sharp edges and a shagreened inner surface; upper edge slightly angulate and meeting anterior edge of pygidium. A fine transverse fold on each side runs from lateral angles close to and parallel with anterior edge as in male, to meet the edges of the depression. Otherwise like male.

Etymology. This species is named for the late Ross Ian Storey, whose lifelong passion for dung beetles in the face of great adversity ignited our own interest in them.



Figs 2-6. *Lepanus storeyi*. (2) male, left fore tibia, dorsal view; (3) male, pygidium; (4) female, pygidium; (5) male, aedeagus, right view; (6) male, aedeagus, left view.

Taxonomic notes

This remarkable little species is unique among Australian *Lepanus* in that the pygidium is dimorphic for males and females. It is also the most colourful species known, exhibiting as it does colours of red, orange, yellow and white against a black background (Fig. 1).

In the key to species of *Lepanus* in Matthews (1974), *L. storeyi* will run to couplet 3 by the possession of a transverse fold on the pygidium and 2 teeth on the outer edge of the fore tibia, but does not fit the characters of either *L. bidentatus* Wilson or *L. globulus* (Macleay). From the latter it is easily distinguished by the smaller size (2.4-2.7 mm against 3.6-5.2 mm long), greater interocular distance (17 times eye width against 7 times eye width), apical digit on male fore tibiae being longer and of a different shape and upper edge of the depression on the female pygidium reaching the anterior edge of the pygidium. From the former it can be distinguished by the greater interocular distance (17 times against 12 times), the elytra being smooth and nitid as opposed to finely shagreened, less densely punctate pronotum and the possession of a sharp edge around the whole of the depression on the female pygidium. From both it differs in the male pygidium lacking a depression and in the colouration. It should be noted that *L. bidentatus*, as considered by Matthews (1974), is now known by the authors to consist of two species, viz. *L. bidentatus* and an undescribed species designated *Lepanus* NSW 2. The characters listed above will distinguish *L. storeyi* from both of these species.

Distribution and conservation status

Lepanus storeyi is known from just nine specimens from three localities (Fig. 7), all in high altitude (above 1000 m) temperate rainforest dominated by the gondwanan tree *Nothofagus moorei* (F.Muell.) Krasser (Fig. 8), on plateau remnants of the rim of the giant Mt Warning Shield Volcano, which forms the Macpherson Range between Queensland and New South Wales. The single locality on Springbrook Plateau is that plateau's highest point. The two sites on Lamington Plateau are on the high eastern rim of that plateau and are only a kilometre apart and 9.5 km from the Springbrook site. These sites are only *ca* 30 km from the coast and receive annual rainfall in excess of 2000 mm, the highest in southern Queensland.

The five Lamington specimens were taken as part of a large collaborative survey, in 2006/07, of targeted insect groups along an altitudinal transect of 20 rainforest plots at Lamington, ranging in altitude from 300 m to a maximum of 1142 m. Known as the Lamington IBISCA Survey, the study is aimed at establishing baseline distribution data for assessment of future changes due to climate change. Dung beetles were a target group and, over four seasons of trapping, 720 trap samples were taken at 100 trap sites in the 20 IBISCA plots. This yielded 9304 specimens of 33 species of dung beetles (Monteith and Menendez, in press).

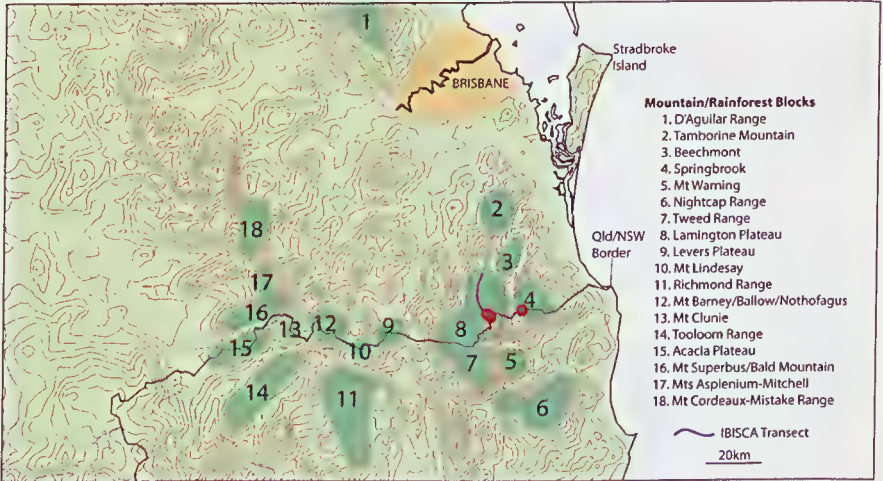


Fig. 7. *Lepanus storeyi* distribution. Map of the border region between Queensland and New South Wales showing the collection points (red dots). The numbered green patches, named in the inset, are the various mountain rainforest massifs that occur in the region. The purple line shows the position of the IBISCA altitudinal transect line.



Fig. 8. Temperate rainforest at Lamington National Park with buttressed trees of *Nothofagus moorei*, habitat of *Lepanus storeyi* (Jeff Wright, Queensland Museum).

The occurrence of only five specimens of *Lepanus storeyi* at only two of the highest Lamington plots, together with its small overall geographic range (10 km diameter), indicates that it may be extremely vulnerable to possible habitat change due to future temperature rise. The wingless species *Lepanus glaber* Matthews has a similarly restricted distribution, geographically and altitudinally, and may also be vulnerable. However, it is much more common, yielding 53 specimens from the IBISCA survey (Monteith and Menendez, in press).

Biology

Lepanus storeyi has not been observed alive, so there are no direct observations on its biology or behaviour. But it is clear from the trapping methods that it is not a dung-feeding species. One was taken in fungus-baited pitfalls, two in unbaited pitfalls, five in flight intercept traps and one from bark-spraying the trunk of a tree. None was taken in the numerous dung traps that were operated at the same time in the same sites that yielded *L. storeyi* during the IBISCA survey (Monteith and Menendez, in press). During that survey several other species of *Lepanus* were taken either wholly (*L. politus* Carter) or predominately (*L. ustulatus* Lansberge, *L. glaber*) at mushroom baits, so it appears that mushroom feeding is a common alternative to dung in this genus.

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